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ABSTRACT

Libraries frequently reject automation because of high costs and lack of expertise. A simple, economical, automated serials records system is presented, based on storage of data on IBM cards. The system was implemented at the Radford College Library to best meet numerous needs. Samples of files and reports are given along with maintenance procedures. Minimum data processing requirements are outlined. Implementation is explained, including cost analysis. The system is easily modified or expanded; suggestions are given. Offering basic serials maintenance tools at low initial and continuing costs, this system may have distinct advantages over many automated systems presented today. (Author)

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AN OFF-LINE SERIALS SYSTEM; A PRACTICAL FIRST STEP INTO AUTOMATION

by

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

IR 005 666

ABSTRACT

Libraries frequently reject automation because of high costs and lack of expertise. A simple, economical, automated serials records system is presented, based on storage of data on IBM cards. The system was implemented at the Radford College Library to best meet numerious needs. Samples of files and reports are given along with maintenance proceedures. Minimum data processing requirements are outlined. Implementation is explained, including cost analysis. The system is easily modified or expanded; suggestions are given. Offering basic serials maintenance tools at low initial and continuing costs, this system may have distinct advantages over many automated systems presented today.

Many libraries reject automating their systems because they believe that costs would be too high and that their staff does not have the knowledge to develop and implement computer systems. The system presented here will shatter these beliefs. The first step into library automation need not be expensive or complex.

A library may automate its operations through a number of approaches. Systems may be designed or purchased which cover most functions from cataloging and order through circulation and personnel. Most libraries, however, have found it practical to begin in a single area; expanding the capabilities of that system and creating new systems as each is perfected. This approach allows the library to gradually introduce its staff to new procedures and its governing body to new expenses.

Comprehensive library automation systems are probably most responsible for the belief that computer assisted processing is too expensive. Few libraries can afford their own mini-computer. Our literature is full of descriptions of systems designed for large research libraries which require expensive equipment and technicians. While they are highly efficient and represent some of our profession's most sophisticated thought in technical services, they are beyond the reach of most libraries.

Just as they first car one buys need not be a Mercedes-Benz; the first automated system in the library need not represent the pinnacle of computer technology. The data processing capabilities of even the most simple computerized system are far above the capabilities of traditional library systems. As new management techniques come into use, these new capabilities become necessities. The system presented here is designed to meet increasing demands from both library administration and library users.

OBJECTIVES

The Serials Records System was implemented at the Radford College Library in the spring of 1975. It was designed to meet objectives common to most libraries. For example: an accurate, readable, easily duplicated holdings list was needed; frequent requests for lists of titles dealing with a particular subject indicated that a subject index would greatly increase service; a reliable system for subscription renewal was needed since existing procedures were tedious and caused many inaccuracies; rationalization of the binding process was necessary to give accurate information on materials selected for and actually sent to the bindery; and, as new demands came from management, the ability to produce special reports with a minimum amount of difficulty was essential. Since new data processing capabilities were being introduced to the Radford College campus, it was important for the library to become a charter user of this service to insure the administration's awareness of the library's need to make use of it now and in the future.

While any one, or several, of these needs could have been met by conventional means, development of a simple automated system was the best solution to all our problems at once.

THE SYSTEM

The Serials Records System is based on storage of information on IBM cards. The cards are periodically run through a card reader into a computer which processes the data and generates the desired reports. Resorting and matching are done internally by the computer. The information is stored in four basic card files:

1. Holdings List File

2. Technical Data File

3. Vendor File

4. Subject Cross Reference File

The Holdings List File

The Holdings List File contains a record for every serial title held by the library, whether active or inactive. Each record is presented on four differenct card formats: title card; subject descriptor card; holdings card; and cross reference card. The file also contains two card formats which instruct the computer to skip a line or eject to a new page. The card format is identified by a number in the first card column of each card.

Each record is assigned a unique number called a Record ID. This number appears on every card pertaining to a particular title and is the only means of identification on all cards except the title card. Figure 1 shows several records in the Holdings List File.

A thesaurus of about 150 subject descriptors was created with specificity as the primary goal in selection and subdivision held to a minimum. Descriptors were limited to 30 characters to economize on computer sorting time. One or more subject descriptors are assigned to each title in the file, empasizing maximum coverage of the content of the journal. Some form descriptors are used to identify such serials as newspapers, foreign language publications, and indexes. Descriptors were created to meet the particular needs of Radford College Library. The subject of education, for example, was subdivided, while engineering received only one descriptor.

The subject descriptor card also contains up to five two-letter codes which show what common indexes cover material appearing in the item. This information helps in providing reference service by eliminating the need to

search for the right index.

The Holdings List File is arranged in alphabetical order by title. Entry is by cover title, with cross references to earlier or later titles. Holdings are simplified, giving open entries for active subscriptions. Microform holdings are included in the overall holdings statement, then shown separately to indicate location.

The Technical Data File

The Technical Data File contains subscription, microform, renewal, and funding data for all active subscriptions. The file is arranged numerically by Record ID. The following data items are stored:

1. vendor
2. renewal month and year
3. subscription price
4. number of copies received
5. order number
6. fund (regular subscription or gift)
7. binding months
8. frequency of publication
9. number of volumes per year
10. microform indicator
11. binding color

Figure 2 shows several cards as they appear in the Technical Data File.

The Vendor File

The Vendor File contains two cards for each vendor from which a subscription is purchased. The first card contains the vendor's name; the second card has the full mailing address. Each vendor was assigned a four

digit numberical code which appears here and on the technical data card. Figure 3 shows several vendor records.

The Subject Cross Reference File

Since only a small number of subject descriptors are used, an extensive cross reference system is employed. This file contains all "see" and "see also" references. A "see" reference uses one card while a "see also" uses two cards. Figure 4 shows cards from the file. This data is merged by the computer into the subject index described later.

Output Products

While this system can generate a wide variety of reports, seven basic listings were chosen for production. The following are brief descriptions of the reports with references to the illustrations.

1. Holdings List. (figure 5) All cards in the Holdings List File are printed. The original printout is photoduplicated to provide copies for in-house use and campus distribution.

2. Subject Index to Serials. (figure 6) This report is arranged alphabetically by subject descriptor with cross references interfiled. All titles having the particular subject descriptor are listed, alphabetically.

3. Subscription Listing. (figure 7) All Technical Data File records are printed with their titles in alphabetical order. This report shows all active subscriptions.

4. Renewal Listing. (figure 8) Information necessary for subscription renewal in printed in chronological order by renewal date.

5. Vendor Listing. All Vendor File data is printed in alphabetical

order by vendor name. The card file is arranged by vendor code.

6. Binding Listing. Arranged chronologically, this report presents titles due for binding along with basic binding information. A change in binding policy resulted in this report not being used at Radford.

7. Record ID Index. Listing titles in Record ID order, this report allows one to find a title when only the Record ID number is known. The Holdings List gives the number when only the title is known.

DATA BASE MAINTEMANCE

One of the distinct advantages of this system is that changes to the files can be made without the computer. The card files are kept in the library where a keypunch is available, primarily for instructional purposes. The small amount of punching required for data base maintenance is done on that machine, using keypunch control cards to expedite punching.

The Holdings List and Subject Cross Reference Files require very little modification. New records are created for new subscriptions and holdings are closed when subscriptions become inactive. Occasionally, another cross reference is added. The Vendor File needs changes of address and new records from time to time. Most changes are made in the Technical Data File as a result of subscription renewals.

Whenever a subscription is renewed, the order number, renewal date, and price must be entered. Following the advantages of IBM card systems, keypunch control cards greatly simplify the process by allowing automatic duplication of unchanged data fields onto the new card; only those items which change are keyed. Even during our peak month of July, all cards may be updated in 2 or 3 hours. Most months require less than one hour of punching.

MINIMUM DATA PROCESSING CAPABILITY

The Serials Records System uses a remote job entry terminal on our campus (IBM 3780 card reader and line printer) to access a computer (IBM 360 dual 155) at nearby Virginia Polytechnic Institute and State University. This system is very large, serving four college in Virginia. Since computer systems vary greatly, a detailed discussion of this equipment is impractical. The minimum requirements for the serials system are examined.

This system requires a keypunch and card input to a computer with line printing output. Given proper programming and hardware, any computer or mini-computer could generate the reports of the system. While any language could be used, the program at Radford was written in COBOL. Reports for the system could also be generated using unit record equipment but the processing would be slow and inefficient.

These are the minimum requirements in terms of cost and technical sophistication. Obviously the objectives could be met using more advanced equipment such as floppy disc or even on-line processing with cathode ray tube access. This equipment would, however, be much more expensive and undermine the economic advantages of the system.

IMPLEMENTATION

The implementation of the Serials Records System was completed in three phases: planning, data capture, and editing. A theoretically sound plan of action was formed but, as frequently happens, we were forced to abandon that plan. When priorities suddenly changed, we had to bring our system to active status much sooner than anticipated. Many of the problems we encountered were based on trying to accomplish our task too quickly. It would also have been

possible to proceed too slowly, however. Maintenance of a certain momentum is important to completion of any large undertaking.

While maintenance of the system called for keypunching by library staff, it was realized that punching of the original deck would proceed too slowly if done in the library. Data capture sheets were therefore coded in the library and passed to Computer Operations to be punched by trained operators.

To meet the shortened timetable, use of student assistants became necessary. A team of 3 students (later expanded to 5) were trained to code forms. While efforts were made to standardize training, differences still appeared. All information entered on the code sheets was verified against the actual material. Subject descriptors were assigned by the serials librarian, most requiring examination of the material also.

Existing records indicated that Radford College Library held some 1,200 serial titles, of which approximately 1,000 were active. Around 1,950 titles were captured into the new system. Most of the increase was due to new rules for entry which split old entries. Saturday Review, for example, was a single entry in the old system and seven entries in the new.

All information was coded during the months of March, April, and May 1975. In our most active week, we captured 350 titles; but the pace varied greatly. The final stage, editing, began in the middle of May.

As soon as the first reports were received, we began carefully checking the data. This editing was basic, enabling us to discover obvious errors such as misspelling and omission. As editing proceeded, errors in our method became obvious. ID numbers had been duplicated; many items of information had been omitted. Inconsistencies reflected the styles of individual coders. The editing

process lasted for one month with corrections being made on about one out of every five cards.

A discussion of specific problems will not be given. Our trouble grew out of using a large number of briefly trained students working for a short period of time. Problems were solved, however, and the system became active in July, 1975. It appears that implementation would have been accomplished more smoothly had we proceeded more slowly with a smaller group of workers.

COST ANALYSIS

Costs of data processing vary greatly. Figure 9 shows the expenditures at Radford College and serves as a model for computation. Seventy-two percent of our costs were wages and salaries. While these costs must be show as part of the total cost of the system, they would have been necessary to maintain the old system too. The additional cost of the system was therefore only about $1,430. The additional annual maintenance cost, based on four sets of listings per year, is about $100.

FUTURE MODIFICATIONS

One of the most important features of the Serials Records System is the ease with which it may be expanded or modified. This may be accomplished by either working with existing equipment or by moving to other hardware.

Additional information can be stored on the cards and new listings can be requested. At Radford, we plan to add information on microform standing orders and organizational memberships immediately. We also plan, in the future, to have computer-generated renewal orders and check-in cards and to use an automated claiming system. These objectives can be met without major modification or new equipment.

The other way in which the system can be expanded is by moving to an on-line

status. Once the data on serials holdings has been put into machine-readable form, it can be converted to any medium of storage. It would be relatively easy for the computer to reformat this information and store it on disc for on-line processing. The capture of the basic serials data has already been completed and need not be done again.

Once the basic system in fully operational, modifications may be gradually added, in what ever form desired, as needs arise and funds permit. Each additional function may be carefully implemented and perfected before additional steps are taken.

CONCLUSIONS

An off-line serials system has been presented which was designed to meet a number of objectives, not the least of which was the introduction of the first automated system to the library. It gives basic serials maintenance tools at very low initial and continuing costs. The system has been presented to give an outline for an automated processing system simple enough to be used in many libraries and to demonstrate that the advantages of improved service through computer processing can be accomplished simply and economically. As operating budgets decrease, management demands on serials systems increase. One answer to tighter control over serials functions while increasing service is the use of a simple automated system.

ACKNOWLEDGEMENTS

Special recognition should be give to Chris Sabo, Computer Operations Office, Radford College, who wrote the programs for the system and turned the plan into a reality. Thanks should also be extended to all the staff of Radford College Library for their suggestions about writing this article. Finally,

the author recognizes that without the many long hours of work by our student assistants, the system would never have become active.

CAPTIONS TO ILLUSTRATIONS

Figure 1:	Holdings List File
Figure 2:	Technical Data File
Figure 3:	Vendor File
Figure 4:	Subject Cross Reference File
Figure 5:	Holdings List
Figure 6:	Subject Index to Serials
Figure 7:	Subscription Listing
Figure 8:	Renewal Listing
Figure 9:	Costs of the System at Radford College

FIGURE 1

8
300971 V.47- 1930-
200971 HOME ECONOMICS
100971 LADIES' HOME JOURNAL
8
700970 FORMERLY LABORATORY ANIMAL CARE
300970 V. 13- 1963
200970 ZOOLOGY
100970 LABORATORY ANIMAL SCIENCE
9
8
700969 CONTINUES AS LABORATORY ANIMAL SCIENCE
300969 V. 13-20 1963-1970
200969 ZOOLOGY
100969 LABORATORY ANIMAL CARE
8
300968 V. 7- 1966- MF V. 9-10
200968 HISTORY
200968 LABOR
100968 LABOR HISTORY
8
300967 NO. 50- 1971-
200967 LINGUISTICS
100967 L. S. A. BULLETIN

HUAMHA

FIGURE 2

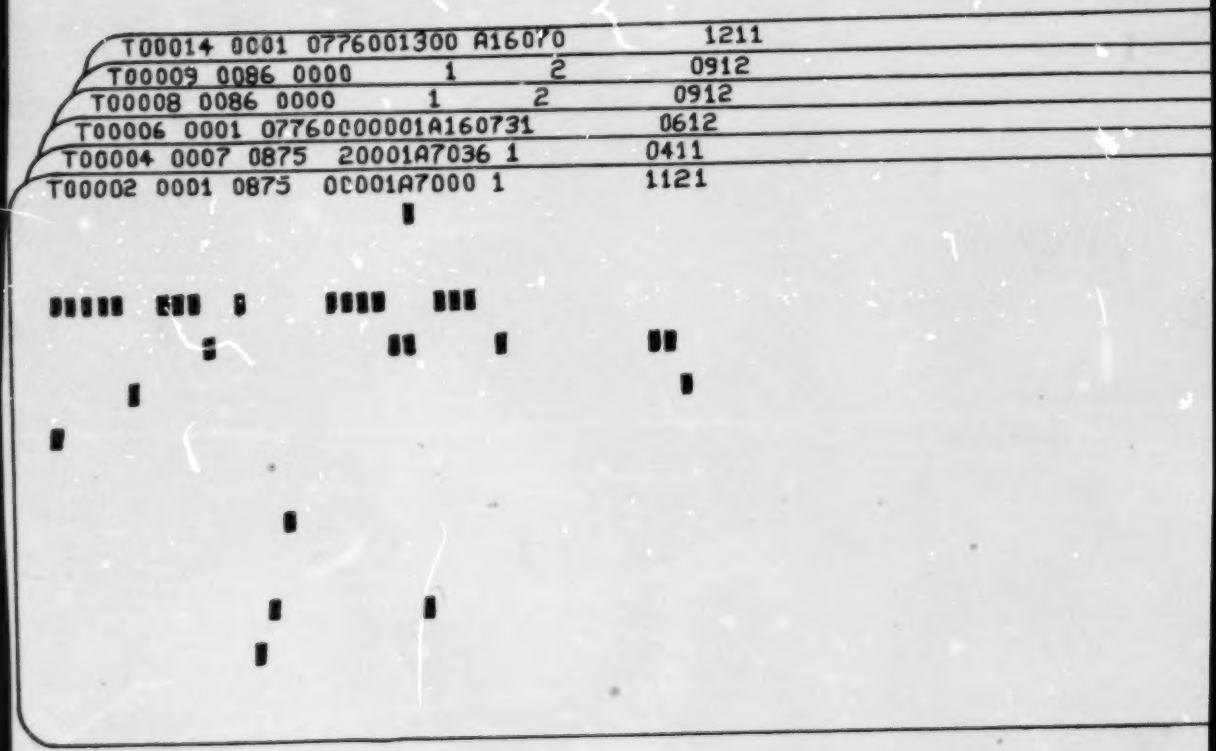
T00014 0001 07760013 00 A16070 1211
T00009 0086 0000 1 2 0912
T00008 0086 0000 1 2 0912
T00006 0001 07760000001A160731 0612
T00004 0007 0875 20001A7036 1 0411
T00002 0001 0875 0C001A7000 1 1121

FIGURE 3

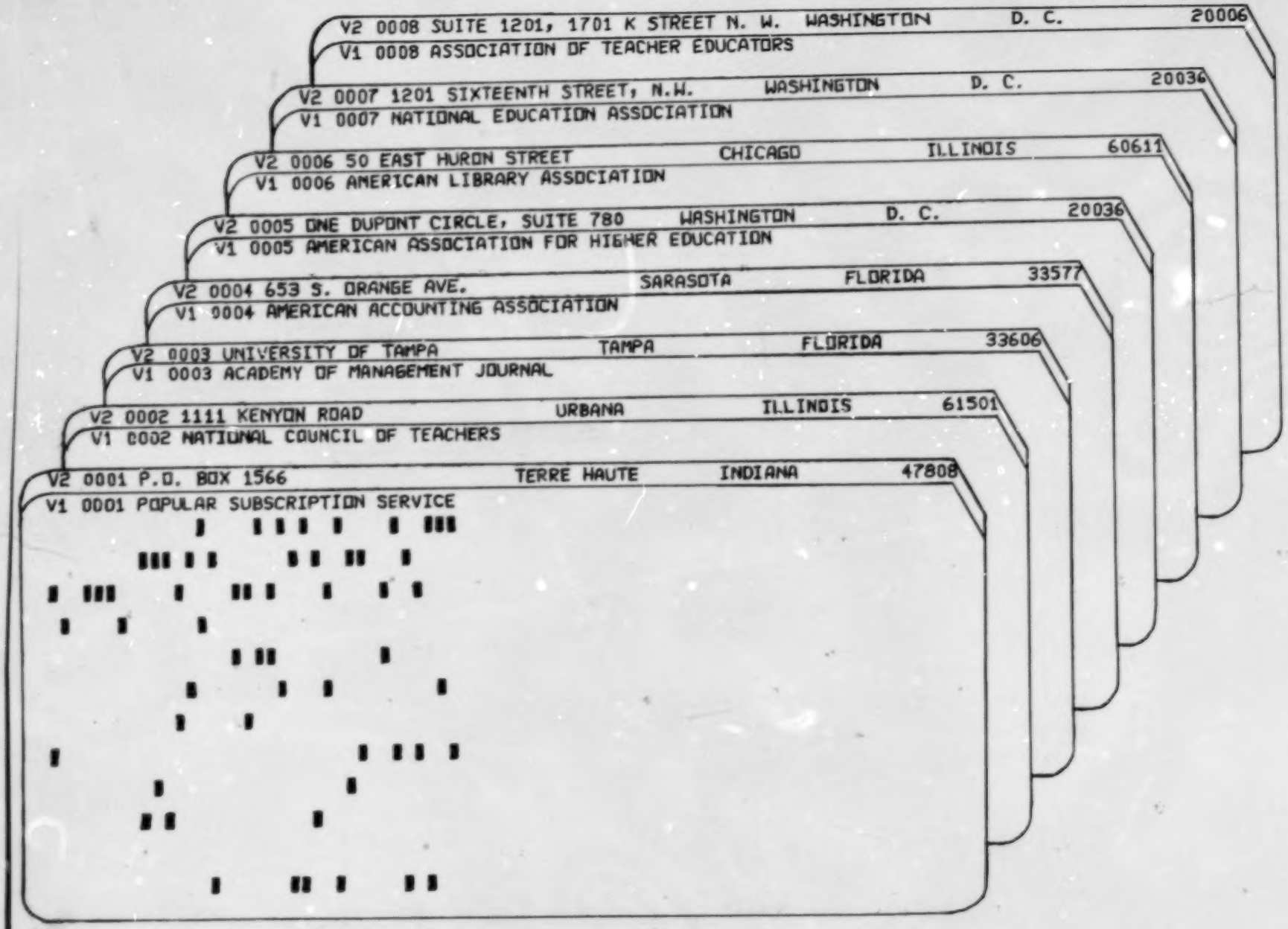
V2 0008 SUITE 1201, 1701 K STREET N. W. WASHINGTON D. C. 20006
V1 0008 ASSOCIATION OF TEACHER EDUCATORS
V2 0007 1201 SIXTEENTH STREET, N.W. WASHINGTON D. C. 20036
V1 0007 NATIONAL EDUCATION ASSOCIATION
V2 0006 50 EAST HURON STREET CHICAGO ILLINOIS 60611
V1 0006 AMERICAN LIBRARY ASSOCIATION
V2 0005 ONE DUPONT CIRCLE, SUITE 780 WASHINGTON D. C. 20036
V1 0005 AMERICAN ASSOCIATION FOR HIGHER EDUCATION
V2 0004 653 S. ORANGE AVE. SARASOTA FLORIDA 33577
V1 0004 AMERICAN ACCOUNTING ASSOCIATION
V2 0003 UNIVERSITY OF TAMPA TAMPA FLORIDA 33606
V1 0003 ACADEMY OF MANAGEMENT JOURNAL
V2 0002 1111 KENYON ROAD URBANA ILLINOIS 61501
V1 0002 NATIONAL COUNCIL OF TEACHERS
V2 0001 P.O. BOX 1566 TERRE HAUTE INDIANA 47808
V1 0001 POPULAR SUBSCRIPTION SERVICE

FIGURE 4

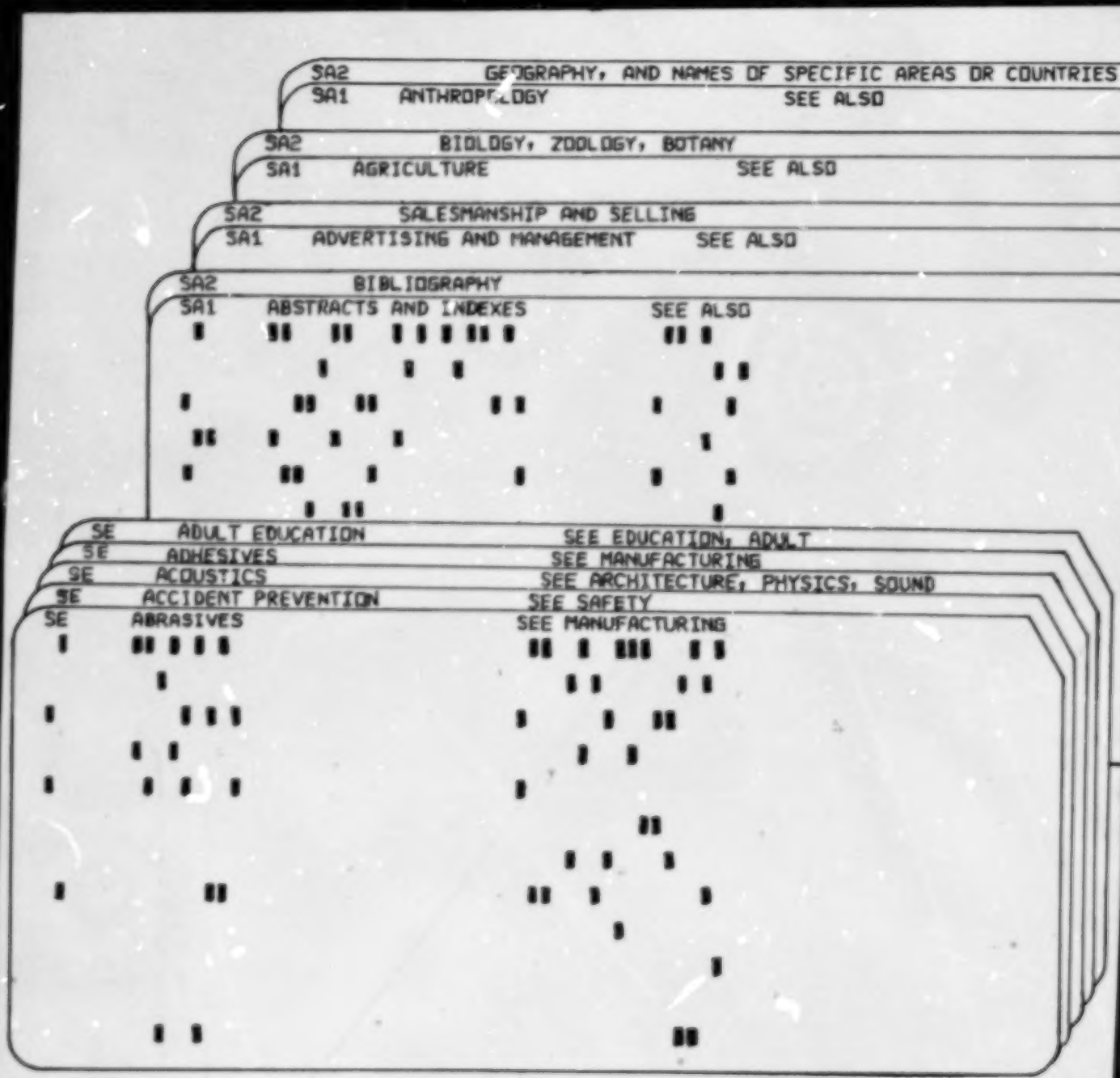
SA2 GEOGRAPHY, AND NAMES OF SPECIFIC AREAS OR COUNTRIES
SA1 ANTHROPOLOGY SEE ALSO
SA2 BIOLOGY, ZOOLOGY, BOTANY
SA1 AGRICULTURE SEE ALSO
SA2 SALESMANSHIP AND SELLING
SA1 ADVERTISING AND MANAGEMENT SEE ALSO
SA2 BIBLIOGRAPHY
SA1 ABSTRACTS AND INDEXES SEE ALSO
SE ADULT EDUCATION SEE EDUCATION, ADULT
SE ADHESIVES SEE MANUFACTURING
SE ACOUSTICS SEE ARCHITECTURE, PHYSICS, SOUND
SE ACCIDENT PREVENTION SEE SAFETY
SE ABRASIVES SEE MANUFACTURING

FIGURE 5

100675 HIGHER EDUCATION
200675 EDUCATION, HIGHER
300675 V.1-20 1945-1964
700675 MERGED WITH SCHOOL LIFE TO FORM AMERICAN EDUCATION

100676 HIGHER EDUCATION AND NATIONAL AFFAIRS
200676 EDUCATION, HIGHER
300676 V. 15-20 1966-1971

100677 HIGHER EDUCATION AND RESEARCH IN THE NETHERLANDS
200677 NETHERLANDS
200677 EDUCATION, HIGHER
300677 V.6- 1962-

100678 HIGHLIGHTS FOR CHILDREN
200678 CHILDREN, FOR
300678 V. 17- 1962-
700678 FORMERLY CHILDREN'S ACTIVITIES

100679 HISPANIA
200679 FOREIGN LANGUAGE, SPANISH
200679 EDUCATION, SPECIFIC SUBJECTS
300679 V.1- 1918-

100680 HISPANIC AMERICAN HISTORICAL REVIEW
200680 LATIN AMERICA
200680 HISTORY HUHAAM
300680 V.1- 1918-

100681 HISPANIC REVIEW
200681 HISTORY HUHACJ
300681 V.9- 1941-

100682 HISTORIA
200682 HISTORY AM
300682 V.17- 1968-

100683 HISTORIAN
200683 HISTORY HUAMHA
300683 V.19- 1956-

100684 HISTORICAL ABSTRACTS
200684 HISTORY
200684 ABSTRACTS AND INDEXES
300684 V. 1- 1955-

100685 HISTORICAL OUTLOOK
200685 HISTORY
300685 V. 10-24 1919-1933
700685 CONTINUES AS SOCIAL STUDIES

100690 HISTORY
200690 HISTORY
300690 V.17-27 1932-1943

100687 HISTORY AND THEORY
200687 HISTORY HUHAPHAM
300687 V.8- 1969-

FIGURE 6

HUMPTY DUMPTY
JACK AND JILL
PACK-O-FUN

CHINA
CHINA QUARTERLY
CHINESE LAW AND GOVERNMENT
CHINESE STUDIES IN HISTORY
CHINESE STUDIES IN PHILOSOPHY
FREE CHINA WEEKLY
OVERSEAS CHINESE SCHOLAR
PEKING REVIEW
SELECTIONS FROM CHINA MAINLAND MAGAZINES
SURVEY OF CHINA MAINLAND PRESS
SURVEY OF PEOPLE'S REPUBLIC OF CHINA PRESS

CINEMATOGRAPHY SEE MOTION PICTURES
CIRCUS SEE ENTERTAINMENT, THEATRE
CITIZENSHIP SEE POLITICAL SCIENCE, WORLD AFFAIRS
CITY PLANNING SEE PUBLIC MANAGEMENT AND PLANNING
CIVIL DEFENSE SEE MILITARY AND NAVAL, PUBLIC MANAGEMENT
CIVIL RIGHTS SEE POLITICAL SCIENCE, WORLD AFFAIRS, LAW
CIVIL SERVICE SEE EMPLOYMENT, INDUSTRIAL RELATIONS
CLASSICAL STUDIES SEE ALSO
ARCHAEOLOGY, HISTORY

CLASSICAL STUDIES
ARION
CLASSICAL JOURNAL
CLASSICAL PHILOLOGY
JOURNAL OF HELLENIC STUDIES
JOURNAL OF ROMAN STUDIES
PHOENIX

CLAY SEE GLASS, STONE AND CLAY
CLOCKS SEE JEWELRY AND HOROLOGY
CLOTHING SEE APPAREL, WOMENS FASHION

CLUBS
BOYS LIFE
CONFEDERATE VETERAN
DAUGHTERS OF THE AMERICAN REVOLUTION MAGAZINE
KIWANIS
NATIONAL PARENT-TEACHER
PTA MAGAZINE
ROTARIAN
TORCH
VIRGINIA CLUB WOMAN

COACHING SEE GAMES AND SPORTS
COINS SEE NUMISMATICS
COLLEGE AND ALUMNI SEE ALSO
EDUCATION, HIGHER

COLLEGE AND ALUMNI
AAUW JOURNAL
CO-ED
COLLEGE STUDENT JOURNAL
COLLEGE STUDENT JOURNAL MONOGRAPH
COLLEGE STUDENT PERSONNEL ABSTRACTS
COLLEGE STUDENT SURVEY
COLLEGIATE NEWS AND VIEWS
COLUMBIA UNIVERSITY FORUM
CRANBROOK MAGAZINE

FIGURE 7

01425 SCHOOL REVIEW
T01425 0001 0776 12001A160731 0412

01427 SCHOOL SCIENCE AND MATHEMATICS
T01427 0001 0776 10001A160731 0911

01428 SCHWANN RECORD AND TAPE GUIDE
T01428 0097 0775 15001A7017 1 1212

01429 SCIENCE
T01429 0001 0776 30001A160731 5221

01430 SCIENCE AND CHILDREN
T01430 0091 0875 8001A7040 1 0811

01431 SCIENCE BOOKS
T01431 0001 0776 12001A7000 1 0812

01432 SCIENCE DIGEST
T01432 0001 0776 4001A160731 1221

01433 SCIENCE EDUCATION
T01433 0001 0775 15001A7000 1 0512

FIGURE 8

2/76	00113	INDUSTRIAL AND LABOR RELATIONS REVIEW	0001	$	8.00
4/76	01901	AMERICA	0001	$	10.00
4/76	01900	ADMINISTRATIVE MANAGEMENT	0001	$	7.00
7/76	00639	GOOD HOUSEKEEPING	0001	$	4.00
7/76	00111	AMERICAN SOCIOLOGICAL REVIEW	0001	$	90.00
7/76	00100	AMERICAN SCIENTIST	0001	$	28.00
7/76	00657	HARPER'S BAZAAR	0001	$	5.67
7/76	00105	AMERICAN SCHOLAR	0001	$	4.75
7/76	00661	HARVARD EDUCATIONAL REVIEW	0001	$	27.00

FIGURE 9

COST ANALYSIS

Implementation

Professional librarian (equivalent of 3 months full time)	$ 2,625
Student assistants (equivalent of 4 for one quarter at $275 per quarter)	1,100
Programming	700
Keypunching & supplies	630
Computer operation	100
Total	$ 5,155

Annual Costs, based on 4 sets of reports per year

Personnel	$ 0*
Supplies	10
Keypunching	0*
Computer operation	100
Total	$ 110

* Absorbed in normal serials collection maintenance costs